PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

EX PARTE MICHAEL L. GOUGH

Application for Patent

Filed 01/12/2001

Serial No. 09/760,209

FOR: HIGH SPEED DATA TRANSFER IN A NETWORKED SERVER ENVIRONMENT VIA LASER COMMUNICATION

APPEAL BRIEF

CERTIFICATE OF MAILING
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to: Commissioner for Patents, P.O.. Box 1450, Alexandria, VA 22313-1450, on November 14, 2005.

Signature: [signature]
Paul L. Hickman

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I. REAL PARTY IN INTEREST

The real party in interest, by assignment, is Neostar, Inc.

II. RELATED APPEALS AND INTERFERENCES

There are no related Appeals or Interferences.

III. STATUS OF THE CLAIMS

All pending claims (claims 1-18, 30-31) have been finally rejected, and are the subject of this Appeal.

IV. STATUS OF THE AMENDMENTS

An amendment after final rejection is submitted herewith to address formalities noted by the Examiner in his final Office Action.

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V. SUMMARY OF EMBODIMENTS OF THE INVENTION

A system and method are provided for accelerating data transfer between networked databases or "servers." First provided are a plurality of databases coupled by a network. At least one laser unit is coupled to each database. In operation, such laser units are capable of communicating data between the databases via free space by way of a laser beam. This allows data communication at a rate faster than that which the network is capable.

In one embodiment, the network includes a router and an Ethernet, and each laser unit includes a transmitter and a receiver. Further, each laser unit may be mounted on the associated database such that the laser units are capable of moving, for example, with two or three degrees of rotational freedom. As an option, a plurality of laser units are mounted on each of the databases for allowing simultaneous communication between multiple databases.

In another aspect, the databases may be positioned in a single housing or building structure. As an option, the housing may have a reflective surface positioned therein for reflecting the laser beam between the laser units. In exemplary embodiments, the housing may be equipped with a substantially hemi-spherical or spherical configuration in order to allow data communication without interference from various databases within the housing.

In another embodiment, the laser units may communicate the data between the databases upon a rate of the communication exceeding a predetermined amount to a single address in one of the databases. Prior to data communication, the laser units may be movably positioned based on a look-up table. The laser beam of the laser units may also be "traced" by using a mathematical model prior to the laser units communicating the data in order to determine whether the laser units are capable of communicating the data. If the trace is unsuccessful, an alternate path may be determined for the laser beam, or the data may be communicated via the network.

VI. ISSUES

A. Is the Examiner's rejection of claim 3 under 35 U.S.C. §112, ¶2 proper?

B. Is the Examiner's rejection of claims 30 and 31 under 35 U.S.C. §102(b) as being anticipated by Fischer proper?

C. Is the Examiner's rejection of claims 1-3, 7, 8, 12, and 13 under 35 U.S.C. §103(a) as being unpatentable over Johnson in view of Fischer proper?

D. Is the Examiner's rejection of claims 4-6, 14, and 16-18 under 35 U.S.C. §103(a) as being unpatentable over Johnson in view of Fischer and further in view of Bloom proper?

E. Is the Examiner's rejection of claim 9 under 35 U.S.C. §103(a) as being unpatentable over Johnson in view of Fischer and further in view of Pasanen proper?

F. Is the Examiner's rejection of claims 10 and 11 under 35 U.S.C. §103(a) as being unpatentable over Johnson in view of Fischer and further in view of Heflinger proper?

G. Is the Examiner's rejection of claim 15 under 35 U.S.C. §103(a) as being unpatentable over Johnson in view of Fischer and further in view of Bloom and further in view of Wood proper?

VII. GROUPING OF THE CLAIMS

A. Issue A – Claim 3 stands or falls on its own.

B. Issue B – Claims 30 and 31 each stands or falls on its own.

C. Issue C – Claims 1-3, 7 and 12 stand or fall together, while claims 8 and 13 stand or fall on their own.

D. Issue D – Claims 4-6 stand or fall together, claim 14 stands on its own and claims 16-18 stand or fall together.

E. Issue E – Claim 9 stands or falls on its own.

F. Issue F – Claims 10 and 11 stand or fall together.

G. Issue G – Claim 15 stands or falls on its own.

VIII. THE CITED ART

A. U.S. Patent No. 5,077,732 to Fischer et al. ("Fischer")

Fischer describes a system wherein multiple different operational capabilities, such as data transfer rates or communication protocols, are selectable for use on a single LAN. Enhanced nodes of the LAN have the capability of utilizing either an enhanced capability or a common capability in communicating with other nodes. Those basic nodes which are not of the enhanced variety have the capability of communicating utilizing the common capability. The enhanced nodes dynamically select the operational capability for the most efficient communication with other nodes.

B. U.S. Patent No. 6,681,116 to Johnson ("Johnson")

Johnson describes a communication system comprising a first communication node connected to a second communication node by a "wireline" for integrating parallel layers of wireless communications for exchange with users. The first communication node comprises a free-space laser device, a first wireless system, and a first wireline device, and a second communication node comprises a second wireless system and a second wireline device.

C. U.S. Patent No. 6,323,980 to Bloom ("Bloom")

Bloom describes a free-space laser communication system. The system is comprised of a large number of "picocells." Each picocell comprises a base station providing conventional communication with at least one user but typically several or many users. Each base stations comprise at least two laser transceivers each transceiver having a pointing mechanism for automatic alignment. These transceivers provide communication with other base stations, relay information between other base stations or transmit information to conventional communication systems. In a "preferred embodiment" the base stations generally comprise four laser transceivers with microprocessor controlled pointing equipment which are aligned automatically to point at other base stations and an RF transceiver to provide communication with users.

D. U.S. Patent No. 6,587,450 to Pasanen ("Pasanen")

Pasanen describes a wireless local area network which comprises at least one server device, one or several peripheral devices, and circuit for transferring information between the server device and the peripheral devices. Transmission of information in the wireless local area network is at least partly arranged to be conducted by a plurality of predetermined link agents, wherein the circuit for transferring information comprise circuit for generating a predetermined link agent circuit for transmitting the generated link agent, circuit for receiving the link agent, circuit for processing the received link agent, and circuit for carrying out one or several operations defined for the predetermined link agent generated.

E. U.S. Patent No. 5,726,786 to Heflinger ("Heflinger")

Heflinger describes a free-space, passively star-coupled optical data bus that uses uniform un-collimated transmission light communicating data among a plurality of transmitter and receiver paired transceiver nodes of respective communication subsystems for communicating data from one transmitting node simultaneously to each of all of the remaining receiving nodes, the data bus being defined by a transmission volume having peripheral optical ports for optically interfacing the transceivers nodes to the free-space communication transmission medium having a distribution means to distribute the light and provide a variety of data bus configurations each supported by protocol addressing and optical modulation for connector-less communications for

improved reliability and reduced costs especially well-suited for conference room, office, and spacecraft applications.

F. U.S. Patent No. 6,466,771, Wood Jr. ("Wood")

Wood describes a wireless communications system comprising a first transponder adapted to be coupled to one of a plurality of selectable antennas, having a look-up table including locations holding data representing antennas, and having pointers pointing to selected ones of the locations, the pointers defining an order in which antennas will be used to attempt communication; and a second transponder configured to communicate with the first transponder, wherein the first transponder uses an antenna defined by data in one location of the table for communication with the second transponder, and, if successful communication with the second transponder is not established, the first transponder uses an antenna defined by data in another location of the table selected in accordance with the order defined by the pointers.

IX. ARGUMENTS

A. *The Examiner's rejection of claim 3 under 35 U.S.C. §112, ¶2 is in error and should be reversed.*

The Examiner asserts that claim 3 is indefinite because of the inclusion of the term "Ethernet." The Examiner argues that "Ethernet" is a trademark/trade name, and therefore does not comply with the requirements of 35 U.S.C. 112, second paragraph, citing Ex parte Simpson, 218 USPQ 1020 (Bd. App. 1982) ("*Simpson*").

What the Examiner ignores is that the term "Ethernet" refers to a published standard. That is, to comply with Ethernet standards, manufacturers must adhere to standardized protocols, such as those put forth by the IEEE. A typical definition of "Ethernet" can be found at www.virtualaccess.com:

> Ethernet is the most widely-installed local area network technology. Specified in a standard, IEEE 802.3, Ethernet was originally developed by Xerox and then developed further by Xerox, DEC, and Intel. An Ethernet LAN typically uses coaxial cable or special grades of twisted

pair wires. The most commonly installed Ethernet systems are called 10BASE-T and provide transmission speeds up to 10 Mbps. Devices are connected to the cable and compete for access using a Carrier Sense Multiple Access with Collision Detection (CSMA/CD) protocol. www.virtualaccess.com/Products/glossary.htm

In *Simpson*, the claim recited a "prefabricated panel for a building system having a surface comprising a thin Hypalon membrane." The Examiner rejected the claim as being indefinite 35 U.S.C. §112, ¶2 because the trademark "Hypalon" was a designation of the source of the membrane, not a description of the structure. On appeal, the CCPA affirmed.

However, the use of a term referring to a standard, such as "Ethernet", is not the use of the term as a trademark or trade name, as in *Simpson.* The term "Ethernet" does not specify or identify a particular manufacturer. Rather is the well known and accepted name for a networking protocol. Furthermore, the term speaks to one of ordinary skill in the art, who would clearly know that Ethernet, as "the most widely installed local network technology" is a defined technology standard, not a trademark or trade name.

Applicant believes that the Examiner's rejection under 35 U.S.C. §112, ¶2 is in error, and respectfully requests reversal by the Board of Patent Appeals and Interferences ("BPAI").

B. *The Examiner's rejection of claims 30 and 31 under 35 U.S.C. §102(b) as being anticipated by Fischer is in error and should be reversed.*

1. The Rejection of Claim 30

Claim 30 is reproduced below:

30. A multi-mode network comprising;

a non-laser network having a first maximum transmission rate;

a laser network having a second maximum transmission rate greater than said first maximum transmission rate;

a plurality of computing units coupled to both said non-laser network and said laser network; and

a data switch transferring data from said network to at least one laser when a data rate of said network is determined to be better handled by said laser network.

It is well established that "[a]nticipation requires the disclosure in a single prior art reference each element of the claim under consideration." W.L. Gore & Associates v. Garlock, Inc., 721 F.2d. 1540. (Fed. Cir. 1983). Fischer does not disclose at least the element of a data switch as claimed by Applicant.

Fischer discloses a system which preferably transmits data between computers via free-space lasers. Only if the laser transmission mode becomes defective, e.g. due an excessive error rate due to free-space interference, would Fischer transmit data via a conventional network connection. That is, Fischer's system is laser-centric, with the network becoming used as a backup in rare situations when the laser system is not effective.

> **Based on the information previously recorded in the capability table 84 or otherwise obtained, the source node will generally transmit at the highest data rate that the destination node is capable of receiving. However, it should also be recognized that a destination node and source node could dynamically negotiate or establish a data rate on a communication-by-communication basis which is less than their maximum capabilities if such circumstances are appropriate. Examples of such circumstances might be where open-air optical or radio communication links are included in the medium 42 and atmospheric or other environmental influences have degraded the integrity of the communication link to a point where a high data rate is more likely to result in the unacceptable amount of transmission errors. Fischer, Col. 10, lines 23-37.**

Therefore, with Fischer's system, a source node and a destination node will dynamically negotiate the data rate to achieve a maximum data rate between the two nodes, regardless of the amount of data being exchanged by the nodes. This is true if one byte or many terabytes of data are to be transmitted.

This can be further understood with reference to Fig. 3 of Fischer (reproduced below). In Fig. 3, a number of transmitters 60a, 60b, ..., 60n, all associated with a database (e.g. a computer system), each are capable of transmitting at their own data rate. Likewise, a number of receivers 62a, 62b, ..., 62n, all associated with the database can receive data at various rates. When in a transmission mode, the database sends at the highest possible data rate that has an acceptable error rate. The other transmitters are idle. Likewise, when in a

reception mode, the database receives at the highest possible data rate having an acceptable error rate, with the other receivers being idle.

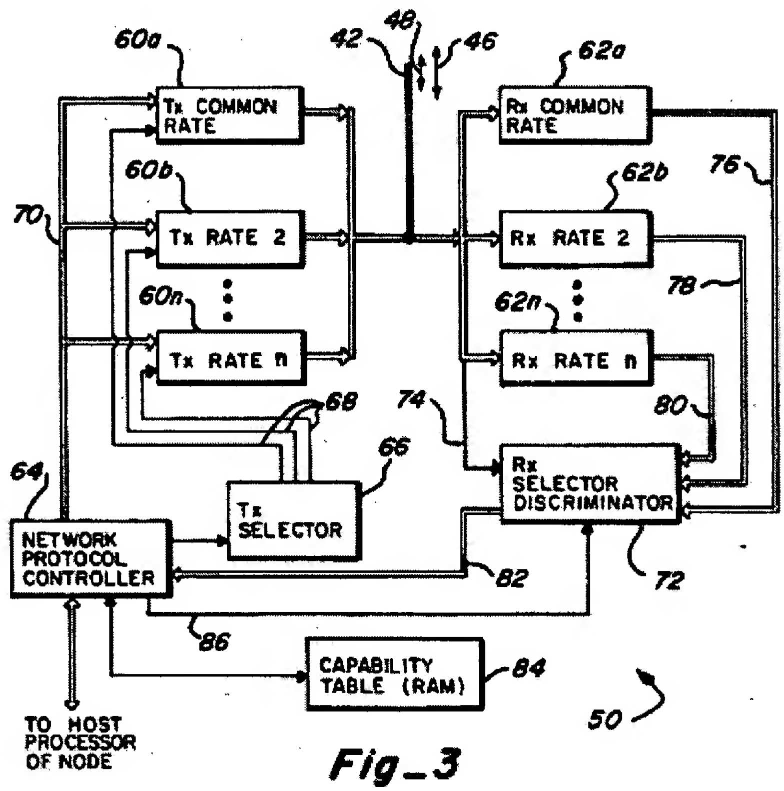


Fig_3

Applicant differs from Fischer in that it is non-laser network centric. That is, much of the time the data is handled by the conventional network. This would be especially true if small amounts of data are to be transferred between databases (computers). That is, the laser systems do not have to be fired up unless there is a great demand on the system, or unless extremely high data rates are required. For this purpose, Applicant includes the element of a data switch which transfers data from the network to at least one laser. Fischer discloses no such data switch.

This is clearly disclosed by Applicant in an exemplary embodiment described with respect to Fig. 7, reproduced below.

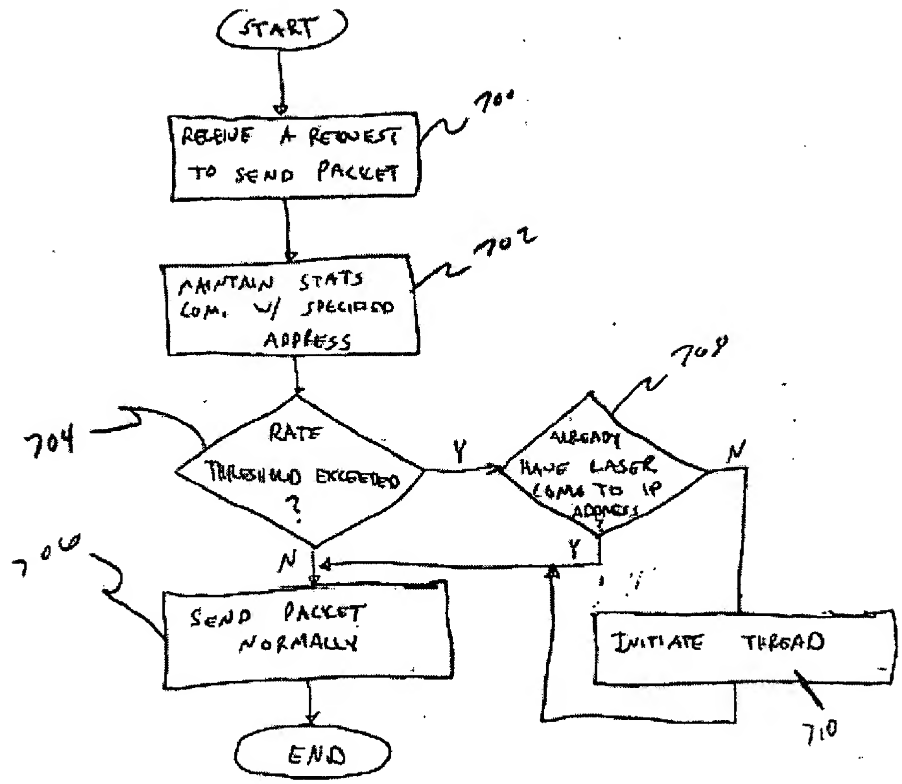


FIG 7.

This figure is discussed in detail in Applicant's specification. For example:

> **With continuing reference to Figure 7, it is determined in decision 704 as to whether the current data transfer rate to a particular destination has exceeded a predetermined quantity. If not, the data is communicated by way of the hard-line network via the Ethernet interface card 206. Note operation 706.**
>
> **If, on the other hand, it is determined in decision 704 that the current data transfer rate to a particular destination has exceeded a predetermined quantity, it is then determined whether laser communication is already allocated to a destination, or whether laser communication is even possible due to obstacles and such. Note decision 708. If laser communication is already allocated to a destination or simply**

not possible for some reason, the data is communicated by the hard-line network via the Ethernet interface card 206 in operation 706.

If it is determined that laser communication is not already allocated to a destination and is feasible, a line of data communication is established via laser units 302 using the laser unit interface card 208 by initializing a thread, as indicated in operation 710. Once the thread is initialized in operation 710, the process continues in operation 706 where the operating system 200 is now aware of not only the conventional hard-line communication with the destination, but also the communication via the laser units 302. Applicant, page 8, line 19 – page 9, line 4.

It is therefore clear that Applicant both monitors the data transmission conditions of the conventional network, and switches data transmission to the laser network only when the data rate of the network is determined to be better handled by the laser network. It is a "network centric" system rather than a "laser centric" system as disclosed by Fischer.

Since Fischer does not disclose or suggest at least one limitation of Applicant's claimed embodiment, the rejection of claim 30 under 35 U.S.C. §102(b) is in error. Applicant respectfully requests that the rejection be reversed.

2. The Rejection of Claim 31

Claim 31 is reproduced below:

31. A method for providing a multi-mode network comprising;

sensing a data rate between a first node and a second node that are coupled together by both a non-laser transmission medium and a laser transmission medium; and

switching between said non-laser transmission medium and said laser transmission medium based upon said data rate.

Fischer, from the discussion above, clearly does not sense a data rate between a first node and a second node. As described above, Fischer, by default, sends by the fastest available transmission mode. Only if the error rate becomes too high does Fischer change to a slower, but presumably more error-free, transmission mode. Therefore, Fischer senses error rate, not data rate, between two nodes. In fact, with the system of Fischer, the data rates of the

various transmitter/receiver pairs may not even be known, only their relative speeds (e.g. faster, slower, slowest). Since Fischer does not sense data rates between nodes, it also does not switch between non-laser transmission medium and laser transmission medium based upon the data rate.

Since Fischer does not disclose or suggest at least one limitation of Applicant's claimed embodiment, the rejection of claim 31 under 35 U.S.C. §102(b) is in error. Applicant respectfully requests that the rejection be reversed.

C. *The Examiner's rejection of claims 1-3, 7, 8, 12, and 13 under 35 U.S.C. §103(a) as being unpatentable over Johnson in view of Fischer is in error and should be reversed.*

1. The Rejection of Claims 1-3, 7 and 12

Claim 1 is reproduced below:

1. A system for accelerating data transfer between networked databases, comprising:

a plurality of databases coupled by a network; and

at least one laser unit coupled to each database for communicating data between the databases via free space by way of a laser beam at a rate faster than that which the network is capable; and

a data rate monitor operative to enable said at least one laser unit when said data rate meets a condition wherein data communication is improved using said at least one laser unit.

In the rejection of claim 1, the primary reference used by the Examiner is Johnson, which teaches a laser communication network in conjunction with a standard network. The key feature of Johnson's system is a <u>qualitative</u> analysis of the data to be transmitted. This is because Johnson's system is designed to send important or critical information in the most reliable fashion, even if it is slow. Simply put, they don't want to risk losing any critical data, regardless of the performance of the system. In stark contrast, Applicant's claim 1 claims a <u>quantitative</u> analysis of the data to be transmitted, which can be used to send the information in the <u>best</u> way possible (e.g. perhaps trading off reliability for speed).

The fact that Johnson is making a qualitative analysis of the importance of the data in deciding which communication linkage to use is clearly supported in his patent specification. For example, Johnson teaches:

> **Operationally, user traffic is configured to utilize the most appropriate one of free-space laser device 308 and wireless system 306 *based on cost and criticality of the traffic*. For example *mission critical traffic* from main frame billing system 324 and *mission critical* customer service center 336 is carried by wireless system 306, while *normal operation traffic* to LAN 316 and media content traffic to media content servers 318 is carried by *free-space laser device* 308. Some examples of *mission critical traffic* include but are not limited to, inbound calls to customer centers and reservation centers, operationally critical data service connections, and billing applications. Some examples of *normal operation traffic* include but are not limited to, media content traffic such as high definition video, Internet traffic, Gigabit LAN traffic, and VoIP traffic. Johnson, col. 6, lines 1-45, *emphasis added*.**

Applicant, however, in claim 1 is claiming the use of a <u>quantitative analysis</u> to determine the *best communication channel*. In particular, as noted above, the Applicant is monitoring the data rate of the transmission. See, for example:

> **As indicated in operation 702, a tally of data communication to various IP addresses is maintained to *track a current data transfer rate* thereto. As an option, such tally may only be maintained for "point-to-point" IP addresses that are resident in databases 300 within the housing 400. ...**
>
> **With continuing reference to Figure 7, it is determined in decision 704 as to *whether the current data transfer rate to a particular destination has exceeded a predetermined quantity*. *If not,* the data is communicated by way of the *hard-line network* via the Ethernet interface card 206. Note operation 706.**
>
> **If, on the other hand, it is determined in decision 704 that the current *data transfer rate to a particular destination has exceeded a predetermined quantity*, it is then determined whether *laser communication* is already allocated to a destination, or whether laser communication is even possible due to obstacles and such. Note decision 708. If laser communication is already allocated to a destination or simply not possible for some reason, the data is communicated by the hard-line network via the Ethernet interface card 206 in operation 706. Applicant's Specification, page 8, lines 11 -29, *emphasis added*.**

Therefore, Johnson and Fischer both monitor error rates, rather than data rates, as claimed by Applicant. Neither disclose a data rate monitor, because the do not monitor data rates. As such, the Examiner has not made a *prima facie* case of obviousness with respect to claim 1.

Since neither Johnson nor Fischer does not disclose or suggest at least one limitation of Applicant's claimed embodiment, the rejection of claims 1-3, 7 and 12 under 35 U.S.C. §103(a) is in error. Applicant respectfully requests that the rejection of these claims be reversed.

2. The Rejection of Claim 8

Claim 8 is reproduced below:

> **8. The system as set forth in claim 1, wherein the databases are positioned in a single housing.**

Claim 8 is dependent upon claim 1, and therefore patentable for at least the same reasons as set forth above with respect to claim 1. Furthermore, neither Johnson nor Fischer disclose a plurality of databases (computers) positioned within a single housing.

Applicant discloses several embodiments wherein the databases are positioned within a single housing. For example, Applicant with respect to Fig. 4 (reproduced below):

> **Figure 4 illustrates the databases 300 of the present invention situated in a single housing 400, or building structure, in accordance with one embodiment of the present invention. As shown, the housing 400 may be equipped with a reflective surface 402 positioned therein for reflecting the laser beam between the laser units 302. In one embodiment, the reflective surface 402 may be positioned on a ceiling of the housing 400. In such embodiment, the laser units 302 may communicate data by directing laser beams at the reflective surface 402 in order to avoid interference from various mechanical structures within the housing 400 including ducts, pillars, and the databases 300 themselves. In operation, the laser units 302 may direct laser beams at a "phantom" laser unit 404 in order to obtain the necessary reflection angle to allow data communication. Applicant's Specification, page 6, line 27 to page 7, line 5.**

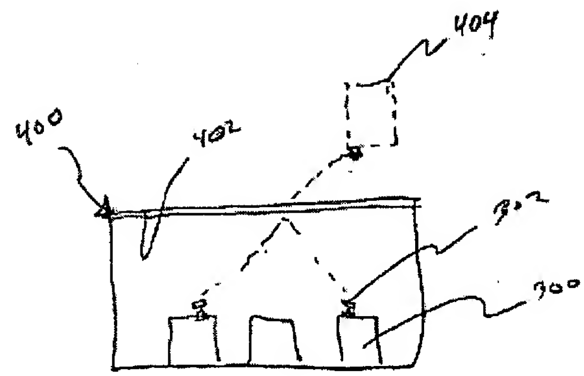


FIG 4

In another exemplary embodiment, with respect to Fig. 5 (reproduced below), the Applicant discloses:

> **Figure 5 illustrates an alternate configuration for housing the databases 300 which facilitates communication via the laser units 302. As shown, the housing 400 may be equipped with a substantially hemi-spherical or spherical configuration for providing data communication without interference from various databases 300 within the housing 400. In such embodiment, an interior surface of the housing 400 may be equipped with a plurality of shelves 500 each adapted for supporting an associated database 300. By this structure, a plurality of cables and/or control lines may be coupled to the databases 300 and run to a place that is easily accessible by a user. As an option, a bulb-like laser beam emitting source may be positioned at the center of the housing 400 for communicating information with each of the receivers 306 of the laser units 302 by transmitting a vast number of laser beams radially from the source. Applicant's Specification, page 7, lines 6-16.**

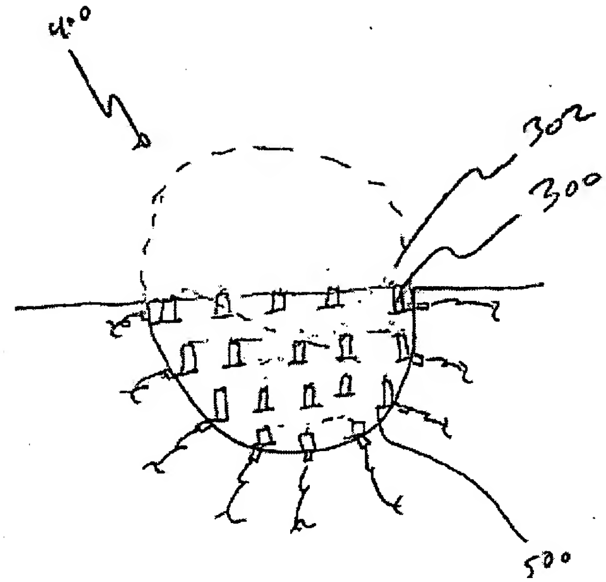


FIG 5

As such, the Examiner has not made a *prima facie* case of obviousness with respect to claim 8. Since neither Johnson nor Fischer does not disclose or suggest at least one limitation of Applicant's claimed embodiment, the rejection of claims 8 under 35 U.S.C. §103(a) is in error. Applicant respectfully requests that the rejection of this claim be reversed.

3. The Rejection of Claim 13

Claim 13 is reproduced below:

> **13. The system as set forth in claim 12, wherein the laser units communicate the data between the databases upon a rate of the communication exceeding a predetermined amount *to a single address* in one of the databases. (emphasis added)**

In this claim, the Applicant is monitoring the data rate to a *single address* in a receiving database. This is, for example, a particular IP address in a database. See, by way of non-limiting example (with reference to Fig. 7, reproduced above):

> **Figure 7 is a flowchart associated with a method that is executed each time the operating system 200 receives a request from an application program 202 to communicate data. As shown, such method begins in operation 700 by receiving a request from the application program 200.**

Such request is commonly accompanied with a destination, or IP address, to which data is to be sent along with the actual data that is desired to be sent.

As indicated in operation 702, a tally of data communication to various IP addresses is maintained to track a current data transfer rate thereto. As an option, such tally may only be maintained for "point-to-point" IP addresses that are resident in databases 300 within the housing 400. To accomplish this, a hash table may be used which includes the IP addresses which are existent in databases 300 within the housing 400. If the IP address is found in such hash table, the tally is continuously tracked. The statistics associated with the tally may take any form including a histogram or the like. Since the statistics are accessed frequently, they may be conveniently stored in the RAM look-up table.

With continuing reference to Figure 7, it is determined in decision 704 as to whether the current data transfer rate to a particular destination has exceeded a predetermined quantity. If not, the data is communicated by way of the hard-line network via the Ethernet interface card 206. Note operation 706.

Neither Johnson nor Fischer disclose monitoring data to a *single address* in one of the databases. As such, the Examiner has not made a *prima facie* case of obviousness with respect to claim 13. Since neither Johnson nor Fischer disclose or suggest at least one limitation of Applicant's claimed embodiment, the rejection of claim 13 under 35 U.S.C. §103(a) is in error. Applicant respectfully requests that the rejection of this claim be reversed.

D. *The Examiner's rejection of claims 4-6, 14, and 16-18 under 35 U.S.C. §103(a) as being unpatentable over Johnson in view of Fischer and further in view of Bloom is in error and should be reversed.*

1. The Rejection of Claims 4-6

Claim 4 is reproduced below:

4. The system as set forth in claim 1, wherein each laser unit is *mounted on* the associated database. (emphasis added)

None of the cited art includes this limitation. There is no disclosure in Johnson or Fischer of a laser unit being *mounted on a database*. The Examiner acknowledges this fact by attempting to cure this deficiency with Bloom. However, Bloom does not disclose

databases communicating by a laser network. Bloom simply discloses a telecommunications network using self-aligning laser coupled base stations. Figure 5 is exemplary:

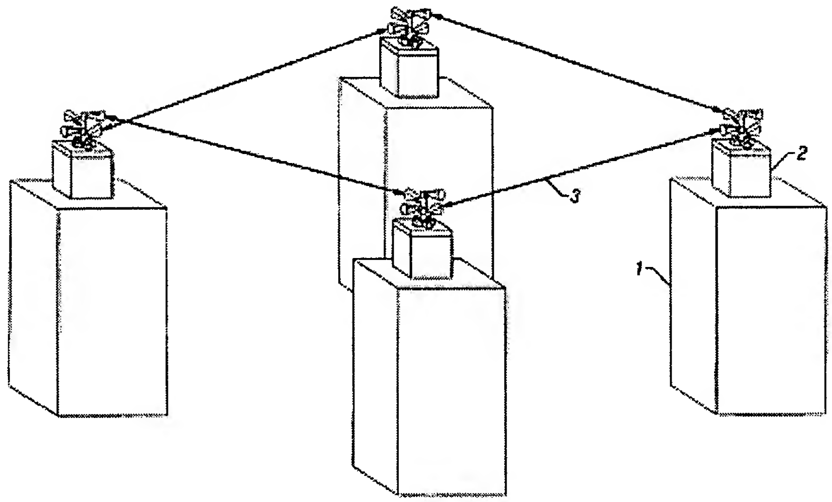


FIG. 5

As noted in Bloom, there are times that it is necessary to establish an emergency telecommunications network. Bloom solves this problem by placing self-aligning telecommunication base stations on top of suitably tall objects, such as buildings. The laser units of the base stations scan and seek out laser communication with other base stations. The process is described thusly:

> **The alignment process can be described by reference to FIG. 5 which depicts four buildings 1 separated from each other by about 100 meters, each with a base station located on their roofs. Microprocessor 22 initiates the first link 3 according to a predetermined algorithm which raster scans a given transceiver's 10 quadrant of +/-45 degrees in azimuth and +/-20 degrees in elevation. The scan rate is set at 0.5 degree/sec in azimuth and the elevation is stepped at 0.5 degrees per azimuthal scan to cover the entire sector. The entire sector can be scanned in four hours. Scanning can be accomplished easily at night when background light levels are low. Bloom, column 5, lines 53-64.**

Bloom does not disclose databases but, rather, telecommunication base stations. Therefore, Bloom does not teach laser units *mounted on a plurality of databases* to provide communication between those databases. Bloom is also improperly combined with Johnson and Fischer since both Johnson and Fischer describe databases coupled for

communication with both lasers and networks, while Bloom describes telephone base stations coupled by lasers alone. Bloom is simply non-analogous art.

As such, the Examiner has not made a *prima facie* case of obviousness with respect to claims 4-6, and the rejection of claims 4-6 under 35 U.S.C. §103(a) is in error. Applicant respectfully requests that the rejection of this claim be reversed.

2. The Rejection of Claim 14

Claim 14 is reproduced below. Claim 14 is dependent upon claim 1, and is therefore patentable over Johnson and Fischer for at least the same reasons as set forth above.

> **14. The system as set forth in claim 1, wherein the laser units are movably positioned into alignment prior to communicating.**

There is no disclosure in Johnson or Fischer of a laser unit being *movably positioned into alignment prior to communicating*. The Examiner acknowledges this fact by attempting to cure this deficiency with Bloom. However, as noted above, Bloom does not teach laser communication between databases as claimed by Applicant. Networks of databases as claimed by Applicant are completely non-analogous to emergency telecommunication networks. Bloom's laser coupled base stations are clearly not databases but, rather, telephone relays.

Again, the Examiner has not made a *prima facie* case of obviousness with respect to claim 14, and the rejection of claims 14 under 35 U.S.C. §103(a) is in error. Applicant respectfully requests that the rejection of this claim be reversed.

3. The Rejection of Claims 16-18

Claims 16-18 refer to mathematical model "tracing" techniques as disclosed by the Applicant. For brevity of argument, Applicant elects to have claims 16-18 to stand or fall with claim 16, reproduced below.

> **16. The system as set forth in claim 1, wherein the laser beam of the laser units is traced prior to the laser units communicating the data in order to determine whether the laser units are capable of communicating the data.**

Applicant, in an exemplary embodiment, uses a mathematical model to "trace" possible paths of laser units prior to the laser units communication of the data. For example, Applicant discloses:

> **Next, in operation 802, proposed geometry for a new configuration is created. Such geometry refers to a potentially feasible path between the physical coordinates of the appropriate laser units 302 by which the laser beam may be directed to accomplish data communication. In order to accomplish this task, the geometry employs a mathematical model representative of the location of the laser units 302, reflective surfaces 402, and obstacles in the housing 400.**
>
> **With continuing reference to Figure 8, the proposed geometry is traced between the transmitters 304 and receivers 306 of the appropriate laser units 302 in operation 804. Tracing may include "ray tracing" where it is ensured that a path is available for communicating with a receiver 306 of a designated laser unit 302. This may be accomplished via analysis of the aforementioned mathematical model. Applicant, page 9, lines 12-22.**

Applicant clearly defines "trace" to mean the use of a mathematical model to determine a proper path for laser communication in a virtual world. There is not a hint or suggestion of the limitations of claim 16 in the references cited by the Examiner. In particular, Bloom does not teach or suggest the use of mathematical models to trace possible paths. The Examiner instead equates the real-world "scanning" of Bloom as being the same as the mathematical "trace" of Applicant's claim. For example, the Examiner cites:

> **The microprocessor in this embodiment is a Pentium PC. It is programmed to align the laser transceivers 10 in this base station with similar laser transceivers in other stations. The alignment process can be described by reference to FIG. 5 which depicts four buildings 1 separated from each other by about 100 meters, each with a base station located on their roofs. Microprocessor 22 initiates the first link 3 according to a predetermined algorithm which <u>raster scans a given transceiver's 10 quadrant of +/-45 degrees in azimuth and +/-20 degrees in elevation. The scan rate is set at 0.5 degree/sec in azimuth and the elevation is stepped at 0.5 degrees per azimuthal scan to cover the entire sector. The entire sector can be scanned in four hours. Scanning can be accomplished easily at night when background light levels are low. For daytime scanning a bright LED source 23 of 10 watts emanating into .pi. steradians can be used in each sector for a total of four sources on each base station.</u> (If alignment can be done at night, much lower power LED's can be used. The sources are shown on FIG. 2 but**

not on FIG. 3. For a probability of acquisition of 0.99 the SNR of source to background needs to be about 10, achievable with a 5 nm interference filter. This procedure is performed in parallel for all four transceivers. Bloom, col. 5, line 50 to col. 6, line 5, emphasis added.

Bloom's "scanning" is clearly accomplished in the physical world by moving the laser beam around to locate a receiver. Applicant's "tracing" is accomplished in a virtual world where items such as laser units, reflective surfaces and obstacles have been mathematically modeled. As such, Bloom's real world "scanning" *teaches away* from Applicant's virtual world "tracing."

The Examiner has not made a *prima facie* case of obviousness with respect to base claim 16, and the rejection of claims 16-18 under 35 U.S.C. §103(a) is in error. Applicant respectfully requests that the rejection of these claims be reversed.

E. *The Examiner's rejection of claim 9 under 35 U.S.C. §103(a) as being unpatentable over Johnson in view of Fischer and further in view of Pasanen is in error and should be reversed.*

Claim 9 is reproduced below:

9. The system as set forth in claim 8, wherein the housing has a reflective surface positioned therein for reflecting the laser beam between the laser units.

In this exemplary embodiment, a plurality of databases (claim 1) are positioned in a single housing (claim 8). At least one laser unit is coupled to each database (claim 1) and a reflective surface is positioned within the single housing for reflecting the laser beam between the laser units. An exemplary embodiment is shown in Applicant's Fig. 4:

Figure 4 illustrates the databases 300 of the present invention situated in a single housing 400, or building structure, in accordance with one embodiment of the present invention. As shown, the housing 400 may be equipped with a reflective surface 402 positioned therein for reflecting the laser beam between the laser units 302. In one embodiment, the reflective surface 402 may be positioned on a ceiling of the housing 400. In such embodiment, the laser units 302 may communicate data by directing laser beams at the reflective surface 402 in order to avoid interference from various mechanical structures within the housing 400 including ducts, pillars,

and the databases 300 themselves. In operation, the laser units 302 may direct laser beams at a "phantom" laser unit 404 in order to obtain the necessary reflection angle to allow data communication. Applicant's Specification, page 6, line 27 to page 7, line 5.

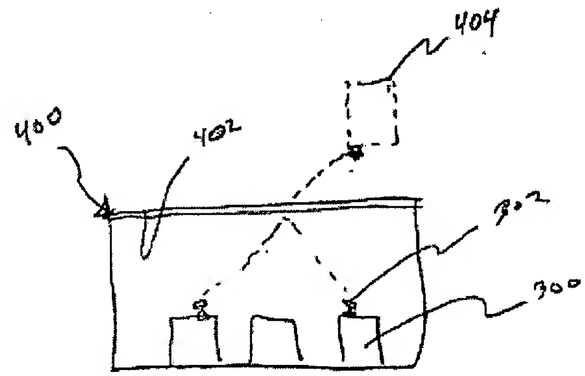


FIG 4

Pasanen teaches an entirely different type of system. As set forth in his abstract:

A wireless local area network (5) comprises at least one server device (1), one or several peripheral devices (6-15), and circuit (4, 16) for transferring information between the server device (1) and the peripheral devices (6-15). Transmission of information in the wireless local area network (5) is at least partly arranged to be conducted by a plurality of predetermined link agents, wherein the circuit for transferring information comprise circuit (4d, 16d) for generating a predetermined link agent circuit (4a, 16a) for transmitting the generated link agent, circuit (4b, 16b) for receiving the link agent, circuit (4d, 16d) for processing the received link agent, and circuit (4d, 16d) for carrying out one or several operations defined for the predetermined link agent generated. Pasanen, Abstract

Pasanen teaches a wireless local area network (LAN) system between computers and peripherals. One transmission medium is infrared (IR) communication. There is no mention of laser communication. There is very little disclosure concerning reflection, other than as reproduced below:

The short-distance module 16 of the peripheral device comprises at least a transmitter 16a and a receiver 16b. An advantageous alternative for

implementing the local area network 5 is a short-range radio network (SDRF, short distance radio frequency), wherein no visual or optically reflective connection is needed between the server device 1 and the peripheral devices 6-15. Thus, the different peripheral devices 6-15 and the server device 1 can be even in different rooms, provided that the distance between the server device 1 and the peripheral devices 6-15 is within the operating span of the local area network. <u>The local area network 5 can also be implemented using infrared data transmission, but in this case there must be a visual connection between the server device 1 and the peripheral devices 6-15 either directly or indirectly via reflective surfaces.</u> Pasanen, col. 5, lines 1-16, emphasis added.

Pasanen therefore fails show any motivation for combining 1) laser communicating databases; 2) in a single enclosure; and 3) a reflective surface within a single enclosure. Again, the Examiner has not made a *prima facie* case of obviousness with respect to claim 9, and the rejection of claim 9 under 35 U.S.C. §103(a) is in error. Applicant respectfully requests that the rejection of this claim be reversed.

F. *The Examiner's rejection of claims 10 and 11 under 35 U.S.C. §103(a) as being unpatentable over Johnson in view of Fischer and further in view of Heflinger is in error and should be reversed.*

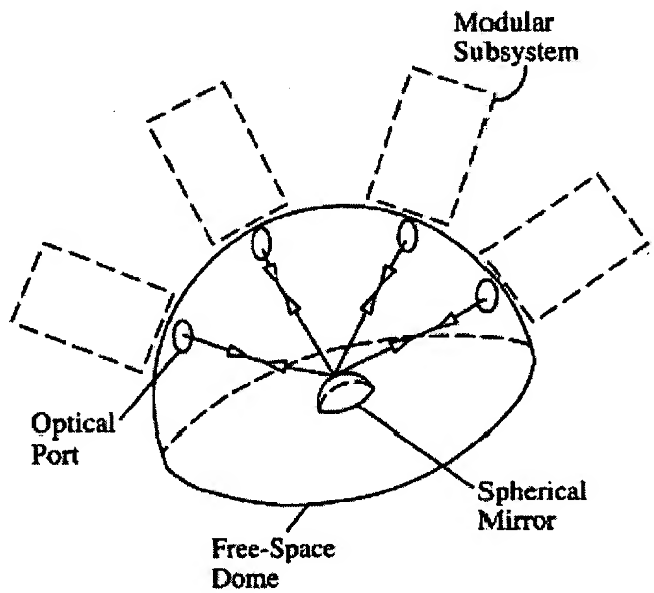
Claims 10 and 11 read as follows:

10. The system as set forth in claim 8, wherein the housing has a substantially hemi-spherical configuration.

11. The system as set forth in claim 8, wherein the housing has a substantially spherical configuration.

These claims add the limitation that the single housing (claim 8) for the plurality of databases with laser units (claim 1) has a substantially hemi-spherical or a substantially spherical configuration. In these exemplary embodiments, the shape of the housing is optimized to permit the highest density of laser units having line-of-sight with other laser units. Applicant's combination works as a switch, coupling two databases together for rapid communication.

Heflinger teaches the use of a hemispherical reflector to, essentially, form a data bus which a plurality of modular substations can access in parallel. See, for example, Fig. 2 and the accompanying descriptions:



Spherical Mirror Free-Space Star-Coupled Optical Data Bus

FIG. 2

> **Referring to FIG. 2, a spherical mirror free-space star-coupled data bus may be used to expand a beam to illuminate an array of data bus nodes clustered and co-located on a free-space volumetric hemisphere. <u>A small spherical mirror performs passive distribution</u> of the transmitted light. A transmitting lens, or holographic optical element, in front of each optical transmitter delivers a collimated beam so as to <u>fully illuminate the spherical mirror with parallel light</u>. The small spherical mirror reflects the light <u>uniformly in all directions so that all the other nodes are able to receive an equal portion of the transmitted light</u>. Heflinger, col. 16, line 60 to col. 17, line 4, emphasis added.**

Heflinger therefore *teaches away* from point-to-point communication. There is no motivation to combine the dome of Heflinger with a plurality of databases and laser units in point-to-point communication. Again, the Examiner has not made a *prima facie* case of

obviousness with respect to claims 10 and 11, and the rejection of these under 35 U.S.C. §103(a) is in error and should be reversed.

G. *The Examiner's rejection of claim 15 under 35 U.S.C. §103(a) as being unpatentable over Johnson in view of Fischer and further in view of Bloom and further in view of Wood is in error and should be reversed.*

Claim 15 is reproduced below:

15. The system as set forth in claim 14, wherein the laser units are movably positioned based on a look-up table.

Wood teaches a system including a plurality of omni-directional antennas. Wood uses a look-up table to determine the order in which the antennas should be tried to establish communications with a remote system. Wood has no disclosure of laser units, and his antennas do not move.

Applicant's claimed embodiment does not use a look-up table to determine the order in which a plurality of antennas (or laser units for that matter) are to be used. Therefore, the look-up tables of Wood and Applicant are entirely different and are used for entirely different purposes. Furthermore, Wood doesn't movably position his antennas. Applicant submits that the Examiner is engaging in impermissible hindsight by, apparently, searching the electronic databases for such terms as "look-up table" and then applying them to his rejection of the claim despite any analogy between the elements and certainly without any motivation to combine.

The Examiner has not made a *prima facie* case of obviousness with respect to claim 15, and the rejection of claim 15 under 35 U.S.C. §103(a) is in error. Applicant respectfully requests that the rejection of this claim be reversed.

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X. CONCLUSION

As noted above, the claims meet the requirements of 35 U.S.C. 112, second paragraph, and are neither anticipated nor unpatentable over the cited references. Accordingly, Applicant believes the rejections to be in error, and respectfully requests the Board of Appeals and Interferences to reverse the Examiner's rejections of the claims on appeal.

Respectfully Submitted,

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Reg. No. 28,516

APPENDIX A - THE APPEALED CLAIMS

1. A system for accelerating data transfer between networked databases, comprising:

a plurality of databases coupled by a network; and

at least one laser unit coupled to each database for communicating data between the databases via free space by way of a laser beam at a rate faster than that which the network is capable; and

a data rate monitor operative to enable said at least one laser unit when said data rate meets a condition wherein data communication is improved using said at least one laser unit.

2. The system as set forth in claim 1, wherein the network includes a router.

3. The system as set forth in claim 1, wherein the network is an Ethernet.

4. The system as set forth in claim 1, wherein each laser unit is mounted on the associated database.

5. The system as set forth in claim 4, wherein a plurality of laser units are mounted on each of the databases.

6. The system as set forth in claim 4, wherein the laser units move with two degrees of freedom.

7. The system as set forth in claim 1, wherein each laser unit includes a transmitter and a receiver.

8. The system as set forth in claim 1, wherein the databases are positioned in a single housing.

9. The system as set forth in claim 8, wherein the housing has a reflective surface positioned therein for reflecting the laser beam between the laser units.

10. The system as set forth in claim 8, wherein the housing has a substantially hemi-spherical configuration.

11. The system as set forth in claim 8, wherein the housing has a substantially spherical configuration.

12. The system as set forth in claim 1, wherein the laser units communicate the data between the databases upon a rate of the communication exceeding a predetermined amount.

13. The system as set forth in claim 12, wherein the laser units communicate the data between the databases upon a rate of the communication exceeding a predetermined amount to a single address in one of the databases.

14. The system as set forth in claim 1, wherein the laser units are movably positioned into alignment prior to communicating.

15. The system as set forth in claim 14, wherein the laser units are movably positioned based on a look-up table.

16. The system as set forth in claim 1, wherein the laser beam of the laser units is traced prior to the laser units communicating the data in order to determine whether the laser units are capable of communicating the data.

17. The system as set forth in claim 16, wherein an alternate path for the laser beam is determined if the trace is unsuccessful.

18. The system as set forth in claim 16, wherein the data is communicated via the network if the trace is unsuccessful.

30. A multi-mode network comprising;

a non-laser network having a first maximum transmission rate;

a laser network having a second maximum transmission rate greater than said first maximum transmission rate;

a plurality of computing units coupled to both said non-laser network and said laser network; and

a data switch transferring data from said network to at least one laser when a data rate of said network is determined to be better handled by said laser network.

31. A method for providing a multi-mode network comprising;

sensing a data rate between a first node and a second node that are coupled together by both a non-laser transmission medium and a laser transmission medium; and

switching between said non-laser transmission medium and said laser transmission medium based upon said data rate.